Science Toolkit: Grade 7 Objective 3.A.1.c

Student Handout: Science: Grade 7 Objective 3.A.1.c

Standard 3.0 Life Science

Topic A. Diversity of Life

Indicator 1. Compile evidence to verify the claim of biologists that the features of organisms connect or differentiate them-these include external and internal structures (features) and processes.

Objective c. Use analogies, models, or drawings to represent that animals and plants have a great variety of body plans and internal structures that define the way they live, grow, survive, and reproduce.

Selected Response (SR) Item

Question

Use the technical passage below to answer the following:

A Natural Snake-Bite Antidote?

Snake bites and bee stings can be either painful or downright deadly, depending on which species is doing the biting, and sometimes whether the person being bitten is allergic to the venom.

New research in mice suggests that these bites and stings would be even more dangerous if not for a special defensive trick that the mouse's immune system can pull off.

Dr. Stephen Galli of Stanford University and his colleagues studied mast cells, which are immune cells that contribute to the inflammation that's part of asthma, allergies and even the extreme, anaphylactic shock[1] that can happen to some people with severe allergies to things like peanuts.

In these cases, the immune system gets mixed up and thinks it's being attacked by something harmful. But, mast cells also do beneficial things in the body. The scientists discovered that the cells also play a helpful role against certain snake and honeybee venoms. In their study they showed that the cells protected mice, making the venom's effects less harmful.

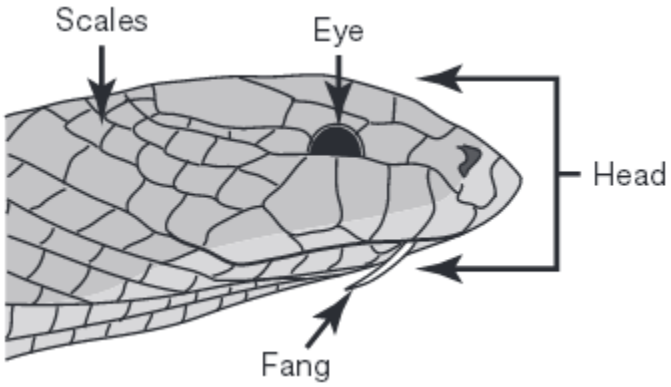
The cells released an enzyme[2] that broke down dangerous components of the venom of a snake called the Israeli mole viper. Dr. Galli said that it might someday be possible to make better snake bite or bee sting treatments that are based on this type of enzyme. More research will be necessary to see if this is possible.

Dr. Galli thinks that this feature of the mast-cell defense system may have evolved, in animals that are prey to snakes or get stung by bees, partly as a way to help to protect against venom. This defense isn't foolproof or perfect, but it gives the prey animals a better chance of survival, especially if they get less than a "full dose" of venom in the bite of a poisonous snake.

[1]anaphylactic shock – a severe allergic reaction that occurs rapidly and causes a life-threatening response
involving the whole body

[2]enzyme – a protein in the body that helps control a chemical reaction

The Israeli mole viper has a small head, shiny black scales, small eyes, and hollow fangs.



Which feature enables the snake to inject venom into prey animals?

A. small head
B. black scales
C. small eyes
D. hollow fangs

Correct Answer

D. hollow fangs

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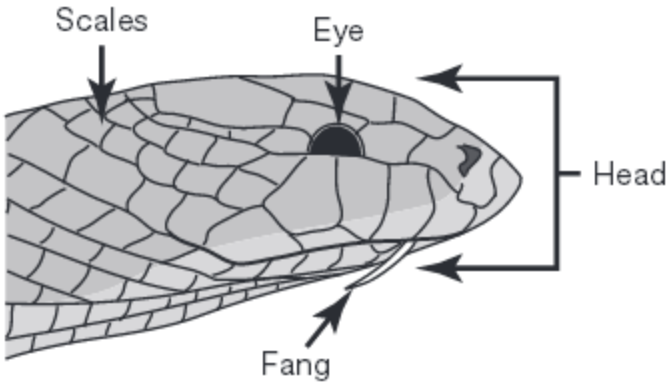

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